

1   **WHAT IS CLAIMED IS:**

2   1.    A process for the recovery of acrylonitrile from a reactor effluent stream  
3   comprising acrylonitrile, water, and organic impurities, comprising the steps of:

4        quenching an ammoxidation reactor effluent stream that comprises acrylonitrile,  
5        water, and organic impurities with an aqueous quench stream, thereby  
6        producing a cooled reactor effluent stream;

7        passing the cooled reactor effluent stream through an absorption column, thereby  
8        generating an absorber bottoms stream that comprises water, acrylonitrile,  
9        and organic impurities; and

10       passing the absorber bottoms stream through a single recovery and stripper  
11       column, generating an acrylonitrile-rich overhead stream, a lean water side  
12       stream, and a recovery and stripper bottoms stream that comprises organic  
13       impurities without an enrichment column.

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15   2.    The process of claim 1, where the acrylonitrile-rich overhead stream is passed  
16   through a decanter to separate water from acrylonitrile.

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18   3.    The process of claim 1, where the lean water side stream is recycled for use in the  
19   absorption column.

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21   4.    The process of claim 1, where the ammoxidation reactor effluent stream is  
22   produced by catalytic reaction of ammonia and propylene.

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24   5.    The process of claim 1, where an acetonitrile stream is removed from said  
25   recovery and stripper column.

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27   6.    The process of claim 5, wherein said acetonitrile side stream comprises 99.0% by  
28   weight of the acetonitrile from said absorber bottoms stream.

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1 7. The process of claim 5, wherein said acetonitrile side stream comprises 99.5% by  
2 weight of the acetonitrile from said absorber bottoms stream.

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4 8. A system for the recovery of pure acrylonitrile from an ammoxidation reactor  
5 effluent stream comprising: (a) an ammoxidation reactor; (b) an absorption column, and  
6 (c) a single recovery and stripper column, the system not including an enrichment  
7 column.

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9 9. The system of claim 8, where at least about 99.0% by weight of acrylonitrile is  
10 recovered from said single recovery and stripper column.

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12 10. The system of claim 8, where at least about 99.5% by weight of acrylonitrile is  
13 recovered from said single recovery and stripper column.

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15 11. The system of claim 8, where at least about 99.7% by weight of acrylonitrile is  
16 recovered from said single recovery and stripper column.